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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,094	10/29/2003	Luc DeBoer	122462.0002.006	6627

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EXAMINER	
COLLINS, GIOVANNA M	

ART UNIT	PAPER NUMBER
3672	

DATE MAILED: 03/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/696,094	DEBOER, LUC	
	Examiner	Art Unit	
	Giovanna M. Collins	3672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *20040129*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed 1/29/04 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. Therefore the document the "IADC/SPE 1996 Drilling Conference Abstract Reporting Form" has not been considered.

Specification

The abstract of the disclosure is objected to because the sentence "A system for controlling drilling mud density at a location either at the seabed (or just above the seabed) or alternatively below the seabed of wells in offshore and land-based drilling applications **is disclosed**."

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, **"The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.**

Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3,8-11,14-17,21-22, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terry 6,840,337.

Referring to claims 1,8,10, and 15, Terry discloses a drilling fluid circulation system for delivering drilling fluid from a first surface location into a wellbore such that the drilling fluid returns carrying cuttings from the wellbore to the first surface location in oil and/or gas well drilling operations, said drilling fluid circulation system comprising: a drilling unit (218) located at the first surface location (at 11) above the wellbore for supplying drilling fluid to the wellbore and for receiving drilling fluid and drill cuttings from the wellbore; a tubular member (near element 46) having an upper end arranged at the first surface location and a lower end extending into the wellbore,; a drill tube (10) having an upper end connected to the drilling unit and a lower end extending into the wellbore via the tubular member, said tube having a outer diameter which is smaller than the inner diameter of the tubular member, said drill tube for carrying drilling fluid from the drilling unit to the wellbore and for defining an annular space between the predetermined outer diameter of the tube and the predetermined inner diameter of the tubular member through which the drilling fluid and drill cuttings return from the wellbore to the first surface location (col. 2, lines 25-31) and a drilling device (21). Terry does not disclose the tubular member has a inner diameter between 12 and 18 inches or the drill tube has a outer

diameter between 6 ¾ and 9 7/8 inches or that the predetermined outer diameter of the drill tube is selected to achieve a predetermined target annular velocity greater than 100 fpm and less than threshold velocity between laminar flow and turbulent flow. However, Terry does disclose that the diameter of the drill tube affects the velocity of the fluid in the annulus (col. 16, line 57-col. 17, line 2). Moreover, it has been held that where the general conditions of a claim are disclosed in the prior art discovering the optimum range or workable ranges involves only routine skill in the art. In re Killing, 895 F.2d 1147, 14 USPQ2d 1056. There it would be obvious to one of ordinary skill in the art at the time of the invention modify the system disclosed by Terry to have tubular member has a inner diameter between 12 and 18 inches, the drill tube has a outer diameter between 6 ¾ and 9 7/8 inches and the predetermined outer diameter of the drill tube is selected to achieve a predetermined target annular velocity greater than 100 fpm and less than threshold velocity between laminar flow and turbulent flow because it has been held that where the general conditions of a claim are disclosed in the prior art discovering the optimum range or workable ranges involves only routine skill in the art.

Referring to claims 2 and 16, Terry discloses a land based drilling unit (at 218).

Referring to claims 3 and 17, Terry disclose a blowout preventer (see Fig. 11b, at 234).

Referring to claims 9 and 21, Terry does not disclose the returning drilling fluid is approximately the optimum target annular velocity of 150 fpm. However, Terry does disclose that the diameter of the drill tube affects the velocity of the fluid in the annulus (col. 16, line 57-col. 17, line 2) and it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ215 (CCPA 1980). Therefore it would be obvious to one of ordinary skill in the art at the time of the

invention to modify the system disclosed by Terry to have the optimum target annular velocity of 150 fpm because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Referring to claims 11 and 22, Terry discloses the tubular member is a surface casing (at 46) and the drill tube is a sting of drill pipes (col. 1, lines 30-34).

Referring to claims 14 and 25, Terry discloses the drilling process is at an underbalanced state (col. 4, lines 15-24).

3. Claims 1,4-6,8,10,11,13,15,18-20, 22, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wardlaw 4,081,039 in view of Terry 6,840,337.

Referring to claims 1, 8,10, and 15, Wardlaw discloses (fig. 1) a drilling fluid circulation system for delivering drilling fluid from a first surface location into a wellbore such that the drilling fluid returns carrying cuttings from the wellbore to the first surface location in oil and/or gas well drilling operations, said drilling fluid circulation system comprising: a drilling unit (14) located at the first location (at 16) above the wellbore for supplying drilling fluid to the wellbore and for receiving drilling fluid and drill cuttings from the wellbore; a tubular member (42) having an upper end arranged at the first surface location and a lower end extending into the wellbore,; a drill tube (52) having an upper end connected to the drilling unit and a lower end extending into the wellbore via the tubular member, said tube having a outer diameter which is smaller than the inner diameter of the tubular member, said drill tube for carrying drilling fluid from the drilling unit to the wellbore and for defining an annular space between the predetermined outer diameter of the tube and the predetermined inner diameter of the tubular

member through which the drilling fluid and drill cuttings return from the wellbore to the first surface location and a drilling device (54). Wardlaw does not disclose the tubular member has a inner diameter between 12 and 18 inches or the drill tube has a outer diameter between 6 ¾ and 9 7/8 inches or that the predetermined outer diameter of the drill tube is selected to achieve a predetermined target annular velocity greater than 100 fpm and less than threshold velocity between laminar flow and turbulent flow. However, Terry does teaches that the diameter of the drill tube affects the velocity of the fluid in the annulus (col. 16, line 57-col. 17, line 2). Moreover, it has been held that where the general conditions of a claim are disclosed in the prior art discovering the optimum range or workable ranges involves only routine skill in the art. In re Killing, 895 F.2d 1147, 14 USPQ2d 1056. There it would be obvious to one of ordinary skill in the art at the time of the invention modify the system disclosed by Wardlaw to have tubular member has a inner diameter between 12 and 18 inches, the drill tube has a outer diameter between 6 ¾ and 9 7/8 inches and the predetermined outer diameter of the drill tube is selected to achieve a predetermined target annular velocity greater than 100 fpm and less than threshold velocity between laminar flow and turbulent flow as suggested by Terry because it has been held that where the general conditions of a claim are disclosed in the prior art discovering the optimum range or workable ranges involves only routine skill in the art.

Referring to claims 4 and 18, Wardlaw discloses the drilling unit is an off shore drilling unit (14) and the first location is near sea level (at 16) and a second surface location is at seabed (at 44).

Referring to claims 5 and 19, Wardlaw discloses a riser (10) have an upper end connected to the drilling unit and a lower end connection to the well bore.

Referring to claims 6 and 20, Wardlaw discloses at blowout preventer (22).

Referring to claims 11 and 22, Maus discloses the tubular member is a surface casing (42) and the drill tube is a sting of drill pipes (52).

Referring to claims 13 and 24, Wardlaw disclose the drilling process is at a near balanced state (col. 9, lines 11-13).

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Terry 6,840,337 in view of Richardson et al. 4,516,633.

Terry does not disclose the returning drill fluid velocity is greater than the slip velocity of the drill cuttings and less than the threshold velocity between laminar flow and turbulent flow. Richardson teaches that in order to convey the drill fluid up the annulus the slip velocity must be exceeded and that too much velocity will cause erosion of the wellbore walls (col. 3, lines 29-40). As it would be advantageous to prevent erosion of the well bore and to ensure the drill fluid returns to the surface, it would be obvious to one of ordinary skill in the art at the time of the invention to modify the system disclosed by Terry to have the returning drill fluid velocity is greater than the slip velocity of the drill cuttings and less than the threshold velocity between laminar flow and turbulent flow as taught by Richardson.

5. Claims 12 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terry 6,840,337 in view of Hopper 4,630,691.

Referring to claims 12 and 23, Terry does not specifically disclose the drilling process is at an overbalanced state. Hopper teaches that drilling at an overbalanced state helps to prevent

blowouts and kicks (col. 1, lines 35-38). As it would be advantageous to prevent blowouts and kicks, it would be obvious to one of ordinary skill at the time of the invention to modify the system disclosed by Terry to have the drilling process to be in a overbalanced state as taught by Hopper.

6. Claims 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maus '583 in view of Terry '337 and Richardson '633.

Referring to claims 26 and 28, Maus discloses (fig. 1) a drilling fluid circulation system for delivering drilling fluid from a first surface location into a wellbore such that the drilling fluid returns carrying cuttings from the wellbore to the first surface location in oil and/or gas well drilling operations, said drilling fluid circulation system comprising: a off shore drilling unit (10) located at the sea level (at 13) above the wellbore for supplying drilling fluid to the wellbore and for receiving drilling fluid and drill cuttings from the wellbore; a tubular member (26) having an upper end arranged at the first surface location and a lower end extending into the wellbore,; a drill tube (19) having an upper end connected to the drilling unit and a lower end extending into the wellbore via the tubular member, said tube having a outer diameter which is smaller than the inner diameter of the tubular member, said drill tube for carrying drilling fluid from the drilling unit to the wellbore and for defining an annular space between the predetermined outer diameter of the tube and the predetermined inner diameter of the tubular member through which the drilling fluid and drill cuttings return from the wellbore to the first surface location ,a drilling device (20) and a riser (23) have an upper end connected to the drilling unit and a lower end connection to the well bore at sea bed. Maus does not disclose the tubular member has a inner

diameter between 12 and 18 inches or the drill tube has a outer diameter between 6 ¾ and 9 7/8 inches or that the predetermined outer diameter of the drill tube is selected to achieve a predetermined target annular velocity greater than slip velocity and less than threshold velocity between laminar flow and turbulent flow. However, Richardson teaches that in order to convey the drill fluid up the annulus the slip velocity must be exceeded and that too much velocity will cause erosion of the wellbore walls (col. 3, lines 29-40). Terry further teaches that the diameter of the drill tube affects the velocity of the fluid in the annulus (col. 16, line 57-col. 17, line 2). Moreover, it has been held that where the general conditions of a claim are disclosed in the prior art discovering the optimum range or workable ranges involves only routine skill in the art. In re Killing, 895 F.2d 1147, 14 USPQ2d 1056. As it would be advantageous to prevent erosion of the well bore and to ensure the drill fluid returns to the surface and it has been held that where the general conditions of a claim are disclosed in the prior art discovering the optimum range or workable ranges involves only routine skill in the art., it would be obvious to one of ordinary skill in the art at the time of the invention to modify the system disclosed by Maus to have the sizes of the tubular and drill tube selected to affect the fluid velocity as taught by Terry and to have the returning drill fluid velocity is greater than the slip velocity of the drill cuttings and less than the threshold velocity between laminar flow and turbulent flow as taught by Richardson.

Referring to claim 27, Maus discloses at blowout preventer (24).

Referring to claim 29, Maus discloses the tubular member is a surface casing (26) and the drill tube is a sting of drill pipes (19).

7. Claims 26-29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wardlaw 4,081,039 in view of Terry 6,840,337.

Referring to claims 26 and 28, Wardlaw discloses (fig. 1) a drilling fluid circulation system for delivering drilling fluid from a first surface location into a wellbore such that the drilling fluid returns carrying cuttings from the wellbore to the first surface location in oil and/or gas well drilling operations, said drilling fluid circulation system comprising: a offshore drilling unit (14) located at sealevel (at 16) above the wellbore for supplying drilling fluid to the wellbore and for receiving drilling fluid and drill cuttings from the wellbore; a tubular member (42) having an upper end arranged at the first surface location and a lower end extending into the wellbore,; a drill tube (52) having an upper end connected to the drilling unit and a lower end extending into the wellbore via the tubular member, said tube having a outer diameter which is smaller than the inner diameter of the tubular member, said drill tube for carrying drilling fluid from the drilling unit to the wellbore and for defining an annular space between the predetermined outer diameter of the tube and the predetermined inner diameter of the tubular member through which the drilling fluid and drill cuttings return from the wellbore to the first surface location, a drilling device (54) and a riser (10) have an upper end connected to the drilling unit and a lower end connection to the well bore at sea bed. Wardlaw does not disclose the tubular member has a inner diameter between 12 and 18 inches or the drill tube has a outer diameter between 6 ¾ and 9 7/8 inches or that the predetermined outer diameter of the drill tube is selected to achieve a predetermined target annular velocity greater than slip velocity and less than threshold velocity between laminar flow and turbulent flow. However, Richardson teaches that in order to convey the drill fluid up the annulus the slip velocity must be exceeded and that

too much velocity will cause erosion of the wellbore walls (col. 3, lines 29-40). Terry further teaches that the diameter of the drill tube affects the velocity of the fluid in the annulus (col. 16, line 57-col. 17, line 2). Moreover, it has been held that where the general conditions of a claim are disclosed in the prior art discovering the optimum range or workable ranges involves only routine skill in the art. In re Killing, 895 F.2d 1147, 14 USPQ2d 1056. As it would be advantageous to prevent erosion of the well bore and to ensure the drill fluid returns to the surface and it has been held that where the general conditions of a claim are disclosed in the prior art discovering the optimum range or workable ranges involves only routine skill in the art., it would be obvious to one of ordinary skill in the art at the time of the invention to modify the system disclosed by Wardlaw to have the sizes of the tubular and drill tube selected to affect the fluid velocity as taught by Terry and to have the returning drill fluid velocity is greater than the slip velocity of the drill cuttings and less than the threshold velocity between laminar flow and turbulent flow as taught by Richardson.

Referring to claim 27, Wardlaw discloses at blowout preventer (22).

Referring to claim 29, Maus discloses the tubular member is a surface casing (42) and the drill tube is a sting of drill pipes (52).

Referring to claim 31, Wardlaw disclose the drilling process is at a near balanced state (col. 9, lines 11-13).

8. Claim 30 rejected under 35 U.S.C. 103(a) as being unpatentable over Wardlaw '039 in view of Terry '337 and Richardson '633 as applied to claim 26 above, and further in view of Hopper '691.

Wardlaw does not disclose the drilling process is an overbalanced state. Hopper teaches that drilling at an overbalanced helps to prevent blowouts and kicks (col. 1, lines 35-38). As it would be advantageous to prevent blowouts and kicks, it would be obvious to one of ordinary skill at the time of the invention to further modify the system disclosed by Wardlaw to have the drilling process to be in a overbalanced state as taught by Hopper.

9. Claim 32 rejected under 35 U.S.C. 103(a) as being unpatentable over Maus '583 in view of Terry '337 and Richardson '633 as applied to claim 26 above, and further in view of Hopper '691.

Maus does not disclose the drilling process is an underbalanced stated. Hopper teaches that drilling at an underbalanced state helps to increase rate of penetration rates (col. 1, lines 38-40). As it would be advantageous to increase the rate of penetration, it would be obvious to one of ordinary skill at the time of the invention to further modify the system disclosed by Maus to have the drilling process to be in a underbalanced state as taught by Hopper.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Giovanna M. Collins whose telephone number is 703-306-5707. The examiner can normally be reached on 6:30-3 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David J. Bagnell can be reached on 703-308-2151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gmc

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